CLAIMS

We Claim:

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- 1. A method of detecting increased S6 kinase activity in a subject, comprising:
 - a) providing a biological sample from a subject; and
 - b) detecting the presence or absence of increased S6 kinase activity in said biological sample.
- The method of claim 1, wherein said detecting the presence or absence of increased
 S6 kinase activity comprises a S6 kinase phosphatase assay.
 - 3. The method of claim 2, wherein said S6 kinase phosphatase assay comprises hybridizing a phosphospecific antibody to a S6 kinase substrate.
- The method of claim 1, wherein said increased S6 kinase activity is indicative of an inactivated protein selected from the group consisting of TSC1 protein and TSC2 protein.
- 5. The method of claim 1, further comprising providing a diagnosis to said subject based on said detecting the presence or absence of increased S6 kinase activity.
 - 6. The method of claim 1, further comprising the step of providing treatment for tuberous sclerosis to said subject, wherein said treatment comprises administering a S6 kinase inhibitor to said subject.
 - 7. The method of claim 6, wherein said S6 kinase inhibitor comprises rapamycin.
 - 8. A method of screening compounds, comprising:
 - a) providing
 - i) a cell expressing S6 kinase; and
 - ii) one or more test compounds; and

- b) screening said test compounds for the ability to inhibit the kinase activity of said S6 kinase.
- The method of claim 8, wherein said screening said compounds for the ability to
 inhibit the kinase activity of S6 kinase activity comprises a S6 kinase phosphatase assay.
 - 10. A method of treating a disease, comprising:
 - a) providing:

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- i) a subject, wherein said subject suffers from a disease, wherein said disease comprises defective cells, wherein said defective cells comprise a defective TSC pathway;
 - ii) an agent; wherein said agent reduces cellular ATP levels; and
 - b) administering said agent to said subject; wherein said agent targets said defective cells.
 - 11. The method of Claim 10, wherein said agent is selected from the group consisting of: a hexokinase inhibitor, 2-deoxy-glucose, a PKC inhibitor, Rottlerin, and 5-aminoimidazole-4-carboxyamide ribonucleotide.
 - 12. The method of Claim 10, wherein said agent is mitochondrial uncoupler FCCP.
 - 13. The method of Claim 10, further comprising co-administration of rapamycin.
- 25 14. The method of Claim 10, wherein said disease is tuberous sclerosis.
 - 15. The method of Claim 10, wherein said disease is cancer.
 - 16. The method of Claim 10, wherein said disease is cardiac hypertrophy.
 - 17. The method of Claim 16, wherein said agent is rapamycin.

18. The method of Claim 10, wherein said defective TSC pathway comprises a defective element of said TSC pathway selected from the group consisting of: TSC1, TSC2, Rheb, mTOR, S6K, and 4EBP-1.